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Can emoji be used as a direct method to measure emotional associations to food names? Preliminary investigations with consumers in USA and China

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ABSTRACT

Measurement of consumers' emotional associations to food/beverage stimuli is one way to obtain product insights that extend beyond hedonic responses. Survey methods are a popular way to obtain direct responses from consumers, but concerns over their ecological validity exist. In this research, a preliminary investigation and assessment of emoji-based questionnaires as a potential method for measuring food-related emotional associations was conducted. Six studies involving 1087 consumers in USA and China were conducted using names of foods and beverages as the stimuli. On average consumers selected 1–2 emoji per stimulus. The elicited data was able to discriminate between stimuli that span the hedonic continuum and generate detailed emotional product profiles. Less discrimination was obtained between hedonically similar stimuli, but meaningful emotional profiles were elicited nonetheless. Repeatability of emoji responses was high and data with good face validity was obtained from American and Chinese consumers. Emoji responses from groups of consumers who liked/disliked a focal stimulus were different (in the expected directions) and frequency of consumption also influenced emoji responses. The preliminary investigations reported here suggest that emoji may have potential as a method for direct measurement of emotional associations to foods and beverages. Additional research is required to further develop this emoji-based approach, including assessment of its pros and cons of and performance relative to existing tools.

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1. Introduction

1.1. Motivation for the research

Interest in measuring consumers' emotional reactions to foods and beverages is growing (Meiselman, 2015). Direct measurement of explicit emotions, where consumers report their emotions using a standardized emotion lexicon are commonly used and questionnaire variants have been developed and applied to a wide range of products (e.g., Chrea et al., 2009; Ferrarini et al., 2010; Gmuer, Nuessli Guth, Runte, & Siegrist, 2015; King & Meiselman, 2010; Porcherot et al., 2010; Spinelli, Masi, Dinella, Zoboli, & Monteleone, 2014).

Despite their popularity, there are concerns about the ecological validity of emotion questionnaires. According to Köster and Mojet (2015), consumers rarely use words to express the emotions evoked by foods and beverages. For this reason, they may select terms even if they are not actually experiencing them before, during or after consumption (Thomson & Crocker, 2015). Jaeger, Cardello, and Schutz (2013) reported that free elicitation generates fewer terms than those included in most emotion questionnaires and that some consumers find the questionnaires odd/weird. Therefore, a need exists for a range of methodologies that can measure how consumers express food-related emotional associations.

Social media has become a relevant source of information about consumer spontaneous emotional reaction to products. Vidal, Ares, Machín, and Jaeger (2015) analysed the content of ~16,000 tweets related to different eating contexts (breakfast, lunch, snack, dinner) and found references to mood and emotions in 28% of the tweets, indicating that spontaneous emotional reaction to food/beverages occurs regularly. Emoticons and emoji were most commonly used and only 6% of the tweets included emotion words.

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Emoticons and emoji can be regarded as abstractions of facial expressions or body gestures (Truss, 2004). Emoticons are created using alphanumerical characters, such as :) for happy, whereas emoji ("picture word" in Japanese) are graphical characters (Oxford Dictionaries, 2015). These non-verbal cues are increasingly used in electronic messages to convey ideas, attitudes, moods and emotions and partially substitute written language (Truss, 2004). Emoji have become popular worldwide on smartphones, social media and email applications (Novak, Smailović, Sluban, & Mozetič, 2015). For example, almost half of the texts posted on Instagram contain emoji (Dimson, 2015). Their relevance was recently acknowledged by the Oxford Dictionaries: the most widely shared emoji ('face with tears of joy') was selected as word of the year in 2015 (Oxford Dictionaries, 2015). Emoji are said to be the fastest growing language in history (Emoji Research Team, 2015) and in South Korea they are considered to be the country's "third language" (after Korean and English) (Studer, 2016).

A wide range of emoji are used for food-related emotional expression on Twitter and usage is content specific. This finding by Vidal, Ares, & Jaeger (2016) point to the potential of emoji as a tool for non-verbal subjective emotion measurement in food-related research. Compared with other non-verbal emotion questionnaires, such as the Product Emotion Measuring Instrument (PrEmo: Desmet, 2003), emoji are already familiar to consumers of different age as they increasingly use them for communicating in social networks, blogs and other electronic devices (Huang, Yen, & Zhang, 2014; Lunagrath, Peck, & Barger, 2016). The familiarity of emoji may contribute to the ecological validity of a new method. Besides, emoji have the potential to overcome language and cultural barriers as they have been embraced as a form of expression throughout the world (Oxford Dictionaries, 2015). Another advantage of emoji is that they are not a proprietary method, but freely available for use in research.

1.2. Research questions and overview of the research strategy

The research was executed as multiple smaller studies to more comprehensively explore the potential of emoji for direct emotion measurement of food/beverage stimuli. Data collection took place in USA and China. This enhanced ability to generalise the findings of the research beyond a single culture, and was appropriate considering today's global activity in research and product innovation.

There were four research questions (RQ): Can emoji characterise and discriminate food names spanning a wide hedonic range (RQ1), as well as food names spanning a more narrow hedonic range (RQ2). The third question asked whether consumers' emoji responses to food/beverage stimuli are replicable (RQ3a) and repeatable (RQ3b). Assessment of the potential of emoji for direct emotion measurement of food/beverage stimuli was completed by RQ4, which explored differences among groups of consumers' responses.

There were two parts to RQ1. Studies 1 and 2 addressed RQ1a and included stimuli from diverse product categories spanning the hedonic continuum. Study 3 addressed RQ1b and included stimuli that spanned the hedonic continuum, but selected from a single product category. To address RQ2, Study 4 used food names that spanned a narrow hedonic range and were similarly liked (RQ2a) or were similarly disliked (RQ2b). Using the stimuli from Study 1, the replicability of participants' responses was directly assessed in Study 6 using a within-subjects approach (RQ3a). In a few instances the same stimuli were included in multiple studies and enabled an assessment of repeatability of results when obtained from two consumer samples drawn from the same general population (RQ3b). For RQ4, focus was directed to comparison of groups of consumers who liked vs. disliked a focal food/beverage or who consumed it frequently vs. never or infrequently. Suitable groupings of consumers for these comparisons were identified by data mining. Details of the different food names used in each study are given in Section 2.2.

2. Materials and methods

2.1. Participants

A total of 1087 participants were involved, with about 150 participants in each of Studies 1–5 (S1 = 153, S2 = 148, S3 = 152, S4 = 145, S5 = 152) and a larger number in Study 6 (S6 = 337).

Participants were residents of either USA (Studies 1, 3–4 and 6) or China (Studies 2 and 5) and had high proficiency in English or Mandarin, respectively. Table 1 summarises participant characteristics in USA (n = 787) and China (n = 300) and shows that, overall, the sample was diverse with respect to key demographic, socio-economic and behavioural characteristics. In USA, age and gender distribution was not statistically different across the 4 studies ($p > 0.05$). The same applied for the 2 Chinese studies ($p > 0.05$).

In all six studies, participants who abstained from eating any major food group and/or otherwise had a restricted diet were excluded (e.g., nut free, dairy free, gluten free or fat free). Additionally, to be eligible for participation, ownership of a hand-held mobile device was required (proxy for familiarity with/use of emoji).

Table 1
Summary information about participants (shown as percentages) from USA (n = 787) and China (n = 300) taking part in the research.

	USA (%)	China (%)
Gender		
Male	54	48
Female	46	52
Age group (years)		
18–30	27	33
31–45	36	33
46–60	37	33
Marital status		
Single	30	23
Married	60	76
Divorced	10	1
Occupation		
Working full time (⩾30 h per week)	60	87
Working part time (<30 h per week)	11	1
No-paid work/home duties/unemployed/other	23	7
Student	6	7
Education		
Middle/high school	15	11
Junior college or vocational college (e.g., electrician, nurse)	32	13
University first degree (e.g., BA, BSc)	32	63
University higher degree (e.g., MSc, MA, MD, MBA, PhD)	21	13
No. of electronic device owned (desktop computer, laptop computer, tablet/Ipad and/or smartphone)		
1 device	2	2
2 devices	24	10
3+ devices	73	88
Internet usage frequency		
2 or more times a week	97	97
Once a week or less	3	3
Emoji usage frequency when sending/posting a message		
Always (i.e., I use emoji/emoticon almost every)	11	53
Sometimes (i.e., I do use emoji/emoticon but not all the time)	51	33
Infrequently (i.e., I rarely use emoji/emoticon)	26	12
Never	11	2

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